

# Obesity in Children and Adolescents

- ❖ The prevalence of overweight among children and adolescents has dramatically increased and is a significant public health concern.
- ❖ Overweight in children and adolescents can be linked to a variety of adverse health outcomes, including type 2 diabetes mellitus, obstructive sleep apnea, hypertension, dyslipidemia, and metabolic syndrome.
- ❖ A BMI percentile  $> 5^{\text{th}}$  and  $< 85^{\text{th}}$  is considered normal weight for height; the  $85^{\text{th}}$  to the  $95^{\text{th}}$  percentile is considered overweight and  $\geq 95^{\text{th}}$  percentile is defined as obesity.
- ❖ Data from the SD BRFSS study showed that 16.4 percent of 5 to 19 year olds are overweight and an additional 16.6 percent are at risk of being overweight (2004-2005 SD Height and Weight Report).

According to the CDC, since the mid 1970s, the prevalence of overweight and obesity has dramatically increased in both adults and children. Data from two NHANES surveys show increases in overweight among children and teens. For children aged 2 to 5 years, the prevalence of overweight increased from 5.0 percent to 13.9 percent; for those aged 6 to 11 years, prevalence increased from 6.5 percent to 18.8 percent; and for those ages 12 to 19 years, prevalence increased from 5.0 percent to 17.4 percent. These increasing rates of obesity and overweight have significant implications to the health care community due to the increase in long-term chronic health problems for all generations of people. Being overweight/obese increases the risk for hypertension, dyslipidemia, type 2 diabetes, coronary artery disease, stroke, gallbladder disease, osteoarthritis, sleep apnea and respiratory problems, and increased risk for some types of cancers (endometrial, breast, and colon). Statistics from South Dakota mirror national trends with 13.9 percent of 2 to 5 years old listed as overweight (BMI-for-age  $95^{\text{th}}$  percentile and above) and an additional 18.1 percent are at risk of becoming overweight (BMI-for-age  $85\text{--}94^{\text{th}}$  percentile BMI-for-age).

## What contributes to overweight and obesity?

There are a variety of factors that play a role in overweight/obesity.

- ❖ Overweight and obesity result from an energy imbalance that involves eating too many calories and not getting enough physical activity. This is directly related to large portion sizes of food and beverages, eating fast food, frequent snacking on high calorie, high fat foods, and consuming sugary beverages (soda, sweetened juices, sports drinks, etc.).
- ❖ Body weight is directly related to genetic tendencies, metabolism, behavior, environment, culture, and socioeconomic status.
- ❖ Behavior and environment play a large role in causing people to be overweight and obese, and are target areas for prevention and treatment activities.
- ❖ Lack of physical activity is another contributing factor to overweight/obese children and adolescents. Less than one-third of high school students (28 percent) currently meet recommended levels of physical activity. Children aged 8 to 18 years of age are more sedentary and spend over 3 hours per day watching television, playing video games, and other media devices.
- ❖ Home, childcare, school, and community environments can influence children's behaviors related to food intake and physical activity. Over 80 percent of children over the age of 5 have working mothers and spend an average of 40 hours per week in childcare facilities. Community environments influence physical activity opportunities for children. Lack of sidewalks, safe bike paths, neighborhood parks, and access to

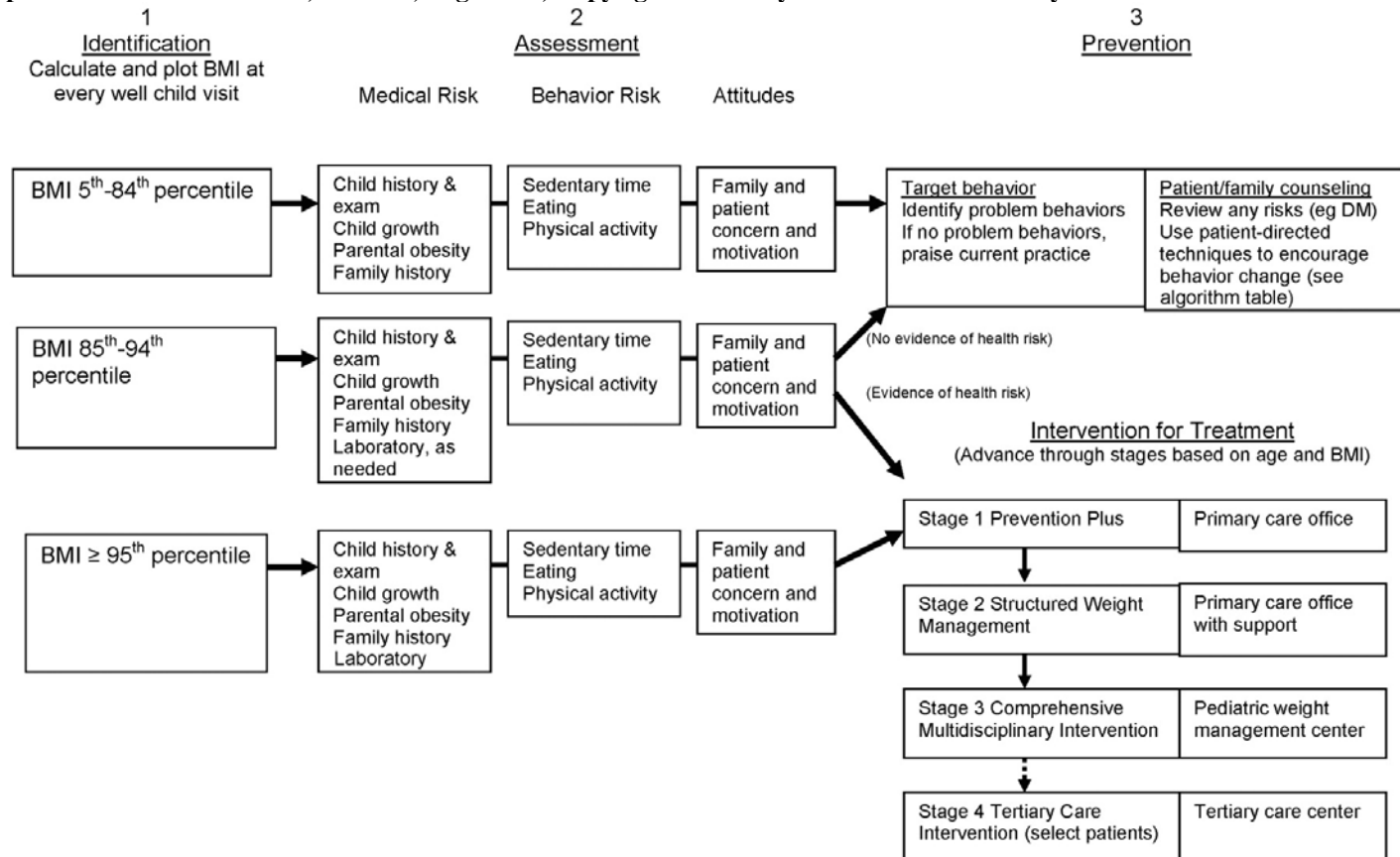
affordable, healthy food choices can be barriers to physical activity and purchasing healthy foods.

## How is BMI used for screening for overweight and obesity in children?

Body Mass Index (BMI) is a practical measure to determine overweight, and is determined by measuring weight in relation to height to determine weight status. BMI is the most widely accepted method used to screen for overweight and obesity in children and adolescents, as it is relatively easy to obtain height and weight measurements. For children and adolescents (aged 2 to 19 years), the result is plotted on the CDC growth charts to determine the corresponding BMI-for-age percentile. Obesity is defined as a BMI at or above the 95<sup>th</sup> percentile for children of the same age and sex and is based on the 2000 CDC Growth Charts for the United States. A child's weight status is determined based on an age and sex-specific percentile for BMI rather than by the BMI categories used for adults. Classifications of excess for children and adolescents are age and sex-specific because children's body composition varies as they age and varies between boys and girls.

### Figure 1: Universal Assessment of Obesity Risk and Steps to Prevention and Treatment

Barlow, S. (2007). Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. *Pediatrics*, 120, S164-S192. **Reproduced with permission from *Pediatrics*, Vol. 120, Page S169, Copyright © 2007 by the American Academy of Pediatrics.**



## What efforts are currently in place to prevent obesity in South Dakota?

The South Dakota Department of Health has developed a statewide plan for *Nutrition and Physical Activity to Prevent Obesity and Other Chronic Disease* (January 2006). This plan targets healthy eating and increased physical activity in both adults and children to achieve a healthy Body Mass Index (BMI). Clinical toolkits to increase awareness of the overweight/obesity problem within the state are available to all healthcare providers through the

South Dakota Department of Health. Because South Dakotans depend upon their personal physicians and health care providers for health-related counseling, it is hoped that the clinical toolkits will serve as a valuable resource in fighting the epidemic of obesity within the state.

The American Medical Association, in collaboration with the Department of Health and Human Services, Health Resources and Services Administration, and the Centers for Disease Control and Prevention, convened an expert committee to develop recommendations on the assessment, prevention, and treatment of child and youth overweight and obesity. This expert panel representing fifteen professional organizations recently recommended changing the terms used to describe pediatric obesity.

If a child's BMI-for-age is between the 85<sup>th</sup> and 94<sup>th</sup> percentile in the CDC reference population for children matched for age and gender, the term to describe the child is "overweight." The previous term used was "at risk for overweight." If a child is at or above the 95<sup>th</sup> percentile for children of that age and gender, the child is considered to be "obese" rather than the previous term "overweight." The new terms overweight and obese provide continuity to adult definitions of overweight and obese and avoid confusion with the term "at risk of overweight." Although the recommended cutoff points have not changed, these definition changes will not affect the prevalence rates of the BMI categories (Barlow et al, 2007).

### **What comorbidities are related to overweight and obesity in youth?**

Overweight and obesity in children is associated with a number of comorbidities that may present during childhood and adolescence. Limited data is available regarding the detrimental effect of overweight, but it is suspected to be similar to that of adults. See Table 7 for adverse outcomes related to childhood obesity.

**Table 7: Adverse Outcomes in Childhood Obesity**

<b>Adverse Outcomes in Childhood Obesity</b>	
<b>Metabolic</b> <ul style="list-style-type: none"> <li>❖ Type 2 diabetes mellitus</li> <li>❖ Metabolic syndrome</li> </ul>	<b>Psychological</b> <ul style="list-style-type: none"> <li>❖ Depression</li> <li>❖ Poor quality of life</li> </ul>
<b>Neurological</b> <ul style="list-style-type: none"> <li>❖ Pseudomotor cerebri</li> </ul>	<b>Hepatic</b> <ul style="list-style-type: none"> <li>❖ Nonalcoholic fatty liver disease</li> <li>❖ Nonalcoholic steatohepatitis</li> </ul>
<b>Orthopedic</b> <ul style="list-style-type: none"> <li>❖ Slipped capital femoral epiphysis</li> <li>❖ Blount's disease</li> </ul>	<b>Pulmonary</b> <ul style="list-style-type: none"> <li>❖ Obstructive sleep apnea</li> <li>❖ Asthma (exacerbation)</li> </ul>
<b>Cardiovascular</b> <ul style="list-style-type: none"> <li>❖ Dyslipidemia</li> <li>❖ Hypertension</li> <li>❖ Left ventricular hypertrophy</li> <li>❖ Atherosclerosis</li> </ul>	<b>Renal</b> <ul style="list-style-type: none"> <li>❖ Proteinuria</li> </ul>

### **What are the screening recommendations?**

Children < 85<sup>th</sup> percentile with no other health risk factors should be screened (weight, height, and BMI percentile calculated and plotted) at every well child visit or at least annually. Identification of risk for overweight before adolescence is encouraged so that health habits can be improved at a stage of increased parental influence and control. See Table 8. Treatment of overweight should rarely be instituted before two years of age because of the rapid growth and

development that occurs during these early years and lower correlation with overweight in later years. Primary care providers should assess diet and activity habits at annual well child visits as part of the overall plan of care.

Family involvement is critical in the treatment of childhood overweight. If treatment is initiated when a family is not ready to support the program, then success is unlikely. The treatment planned should also take into consideration long-term management with the continued assessment of the child for adequate growth and development because overweight is a long-term problem. See Table 8.

### **What are the guiding principles used in the treatment and management of overweight/obesity?**

The following five guiding principles provide an important framework for healthcare providers in the treatment of overweight/obese children and adolescents. Treatment should focus on a comprehensive multidisciplinary approach, targeting eating, activity, and behavior modification in a structured outpatient setting.

1. Establish individual treatment goals and approaches based on the child's age, degree of overweight, and presence of co-morbidities.
  2. Involve the family or major caregivers in the treatment.
  3. Provide frequent assessment and monitoring of the patient, and track and store data for future reference and comparison studies.
  4. Consider behavioral, psychological, and social correlates of weight gain in the treatment plan.
  5. Provide recommendations for dietary changes and increases in physical activity that can be implemented within the family environment and that foster optimal health, growth, and development.
- (American Heart Association, 2005)

### **What is the 5-2-1-0 Healthy Behavior Method?**

The 5-2-1-0 Healthy Behavior Method is a prevention tactic that families can employ to get children to incorporate healthy lifestyle changes into their daily activities and manage overweight/obesity:

- Five:** Eat at least five servings of fruits and vegetables daily
- Two:** Spend two hours or less of television/media activities daily
- One:** Get at least one hour of physical activity every day
- Zero:** Consume zero sugar-sweetened beverages daily, limit eating out

### **What are some of the reasons for treatment failure?**

Physicians need to tailor their interventions to meet family needs, habits, culture, and risk factors. Physicians and office staff can learn the techniques and tools for utilizing motivational interviewing focusing on asking, listening, advising, and informing. Often patients are poorly motivated to make lifestyle or behavioral changes and feel a sense of futility and lack of empowerment in treatment of overweight/obesity. When treating overweight children and adolescents, parents need to be included in the plan of care and become motivated to achieve positive outcomes.

**Table 8: Medical Screening According to BMI Category**  
(Adapted from Barlow et al, 2007)

<b>BMI Percentile</b>	<b>Recent History</b>	<b>Medication Use</b>	<b>Review of Symptoms</b>	<b>Family History</b> (1 <sup>st</sup> & 2 <sup>nd</sup> degree relatives)	<b>Physical Examination</b>	<b>Laboratory Tests</b>
5 <sup>th</sup> -84 <sup>th</sup>	BMI percentile change	Medications that may affect weight gain (e.g. neuro-psychiatric)		Obesity, type 2 DM, hypertension, lipid level abnormalities, heart disease	Blood pressure (correct cuff)	
85 <sup>th</sup> -94 <sup>th</sup>	BMI percentile change	Medications that may affect weight gain (e.g. neuro-psychiatric)	Snoring/sleep, abdominal pain, menstrual irregularities, hip, knee, or leg pain, polyuria, thirst, depression	Obesity, type 2 DM, hypertension, lipid level abnormalities, heart disease	Blood pressure (correct cuff), Acanthosis Nigricans, tonsils, goiter, tender abdomen, liver, bowing of legs, limited hip range of motion, optic discs if headaches, acne, and hirsutism	Fasting lipid profile; if age 10 years and other risk factors, fasting glucose level biannually; ALT and AST levels biannually
95 <sup>th</sup> -99 <sup>th</sup>	BMI percentile change	Medications that may affect weight gain (e.g. neuro-psychiatric)	Snoring/sleep, abdominal pain, menstrual irregularities, hip, knee, or leg pain, polyuria, thirst, depression	Obesity, type 2 DM, hypertension, lipid level abnormalities, heart disease	Blood pressure (correct cuff), Acanthosis Nigricans, tonsils, goiter, tender abdomen, liver, bowing of legs, limited hip range of motion, optic discs if headaches, acne, and hirsutism	Fasting lipid profile; if age 10 years and other risk factors, fasting glucose level biannually; ALT and AST levels biannually
> 99 <sup>th</sup>	BMI change	Medications that may affect weight gain (e.g. neuro-psychiatric)	Snoring/sleep, abdominal pain, menstrual irregularities, hip, knee, or leg pain, polyuria, thirst, depression	Obesity, type 2 DM, hypertension, lipid level abnormalities, heart disease	Blood pressure (correct cuff), Acanthosis Nigricans, tonsils, goiter, tender abdomen, liver, bowing of legs, limited hip range of motion, optic discs if headaches, acne, hirsutism, skin inflammation	Fasting lipid profile; if age 10 years and other risk factors, fasting glucose level biannually; ALT and AST levels biannually

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